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[1] Waltner, A., and Rogers, F. T., *Phys. Rev.*, **74**, 699 (1948); **75**, 1445 (1949).
[2] Langer, L. M., Motz, J. W., and Price, H. C., *Phys. Rev.*, **77**, 774, 798 (1950).

A Simple X-Ray Micro-beam Technique

A simple method has been devised to enable X-ray diffraction photographs to be obtained from a single plant cell the size of which is of the order of 10 μ × 10 μ × a few mm. long. Although details of methods using micro-focus tubes and micro-beams have been published, they are not suitable in this instance because of the low diffracting power of cellulosic materials.

Small lead-glass capillaries are not satisfactory because scatter from the edges of the aperture is great enough to obscure diffraction from the specimen. Using metal pin-holes, it is extremely difficult to make and adjust the necessary secondary aperture, so that satisfactory results are never obtained.

The system in use at present (Fig. 1) consists of two tilted metal plates mounted over the exit aperture of a collimator with two ½-mm. pin-holes 50 mm. apart. The geometry of the system is made such that the corners of the plates define the beam (30 μ wide) while the edges prevent scatter from these corners reaching the photographic film. Because long specimens are used and because we are only concerned with the equatorial arcs, only one pair of plates is used; however, a second pair mounted at right-angles to the first could be used if it became necessary either to use a square beam or to remove the meridional streak, or both. The large entrance aperture allows the whole of the X-ray source of normal dimensions to be used.

The specimen is mounted directly on the collimator; to ensure that it will be in the X-ray beam, light is passed through the whole collimator and the specimen adjusted, under a binocular microscope, to be in the light beam. The collimator carrying the specimen is then transferred to a normal flat-film camera. A Geiger counter and rate-meter are essential for lining up the collimator with the X-ray source.

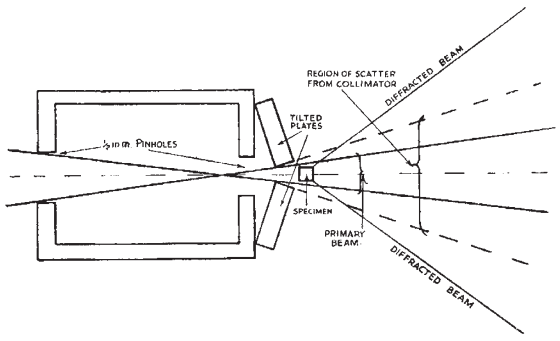

Fig. 1. Diagrammatic section of collimating system

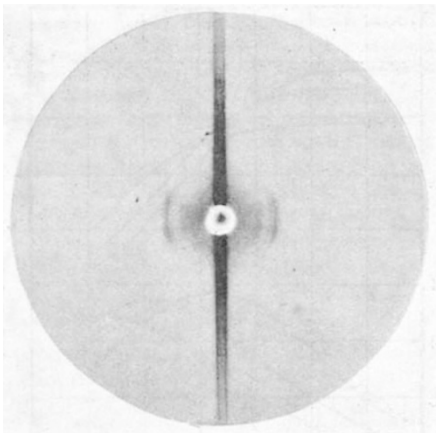

Fig. 2. X-ray photograph from a single sisal cell. Film to specimen, 17 mm.; beam, 30 μ × 400 μ; unfiltered copper *K* radiation; exposed 100 hr. on Hilger *HRX* unit operating at about 35 m.amp. and 40 kV.

Fig. 2 illustrates the type of photograph given by a single cell of sisal using this method.

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Resonance Absorption in Liquid Methyl Palmitate and Methyl Stearate in the Microwave Region

In a previous communication in *Nature*[1], it was pointed out that dielectric measurements on solid methyl palmitate, in the microwave region, showed features which were difficult to explain on the basis of a purely relaxation type of loss, and it was suggested that resonance absorption was occurring at some frequency in this region. This conclusion was criticized[2], and it must be admitted that the evidence was not entirely convincing.

Measurements have since been made on stearic and palmitic acids and their methyl and ethyl esters at temperatures ranging from the melting points to about 30 or 40 deg. C. above the melting points. The measurements at 3·2 cm. and 1·26 cm. were obtained by the Roberts – von Hippel method, and the measurements at the other wave-lengths, 17, 10, 9, 8, 6·5, 5, 4·5 and 4 cm., were obtained by a phase and amplitude balance method using coaxial-line equipment. This method is a development of one described by me elsewhere[3] and is similar to that described by Branin and Smyth[4]. The wave-lengths 5, 4·5 and 4 cm. were obtained by harmonic generation.

The acids show a fairly small loss in the microwave region, with a suggestion of a small relaxation loss near 3 cm. wave-length. The loss in the methyl and ethyl esters was much greater than in the acids. The curves of ε' and ε'' as functions of frequency are, in the case of the ethyl esters, normal relaxation loss curves with a spread of relaxation times. The measurements on ethyl palmitate are shown in Fig. 1. Ethyl stearate gives similar curves. The results for